

policy. The State Water Board established California's antidegradation policy in State Water Board Resolution 68-16 ("Statement of Policy with Respect to Maintaining High Quality of Waters in California") (State Anti-Degradation Policy). The State Anti-Degradation Policy is deemed to incorporate the federal antidegradation policy where the federal policy applies under federal law. The State Anti-Degradation Policy requires that existing water quality be maintained unless degradation is justified based on specific findings. The Central Valley Water Board's Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies. The permitted discharge must be consistent with the antidegradation provision of 40 C.F.R. section 131.12 and the State Anti-Degradation Policy. The Board finds this order is consistent with the Federal and State Water Board antidegradation regulations and policy.

5. **Anti-Backsliding Requirements.** Sections 402(o) and 303(d)(4) of the CWA and federal regulations at 40 C.F.R. section 122.44(l) restrict backsliding in NPDES permits. These anti-backsliding provisions require that effluent limitations in a reissued permit must be as stringent as those in the previous permit, with some exceptions in which limitations may be relaxed.
6. **Domestic Water Quality.** In compliance with Water Code section 106.3, it is the policy of the State of California that every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes. This Order promotes that policy by requiring discharges to meet maximum contaminant levels designed to protect human health and ensure that water is safe for domestic use.
7. **Endangered Species Act Requirements.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code, §§ 2050 to 2097) or the Federal Endangered Species Act (16 U.S.C.A. §§ 1531 to 1544). This Order requires compliance with effluent limits, receiving water limits, and other requirements to protect the beneficial uses of waters of the state. The Discharger is responsible for meeting all requirements of the applicable Endangered Species Act.
8. **Emergency Planning and Community Right to Know Act.** Section 13263.6(a) of the Water Code, requires that *"the Regional Water Board shall prescribe effluent limitations as part of the waste discharge requirements of a POTW for all substances that the most recent toxic chemical release data reported to the state emergency response commission pursuant to Section 313 of the Emergency Planning and Community Right to Know Act of 1986 (42 U.S.C. Sec. 11023) (EPCRA) indicate as discharged into the POTW, for which the State Water Board or the Regional Water Board has established numeric water quality objectives, and has determined that the discharge is or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to, an excursion above any numeric water quality objective"*.

The most recent toxic chemical data report does not indicate any reportable off-site releases or discharges to the collection system for this Facility. Therefore, a reasonable potential analysis based on information from EPCRA cannot be conducted. Based on information from EPCRA, there is no reasonable potential to cause or contribute to an excursion above any numeric water quality objectives included within the Basin Plan or in any State Water Board plan, so no effluent limitations are included in this permit pursuant to Water Code section 13263.6(a).

However, as detailed elsewhere in this Order, available effluent data indicate that there are constituents present in the effluent that have a reasonable potential to cause or

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contribute to exceedances of water quality standards and require inclusion of effluent limitations based on federal and state laws and regulations.

9. **Storm Water Requirements.** U.S. EPA promulgated federal regulations for storm water on 16 November 1990 in 40 C.F.R. parts 122, 123, and 124. The NPDES Industrial Storm Water Program regulates storm water discharges from wastewater treatment facilities. Wastewater treatment plants are applicable industries under the storm water program and are obligated to comply with the federal regulations. The Discharger has submitted a Notice of Intent (NOI) and been approved for coverage under the State Water Resources Control Board (State Water Board) Water Quality Order 2014-0057-DWQ, General Permit for Storm Water Discharges Associated with Industrial Activities (NPDES General Permit No. CAS000001). Therefore, this Order does not regulate storm water.
10. **Statewide General Waste Discharge Requirements for Sanitary Sewer Systems.** The State Water Board issued General Waste Discharge Requirements for Sanitary Sewer Systems, Water Quality Order 2006-0003-DWQ (General Order) on 2 May 2006. The State Water Board amended the MRP for the General Order through Order WQ 2013-0058-EXEC on 6 August 2013. The General Order requires public agencies that own or operate sanitary sewer systems with greater than 1 mile of pipes or sewer lines to enroll for coverage under the General Order. The General Order requires agencies to develop sanitary sewer management plans (SSMP's) and report all sanitary sewer overflows (SSO's), among other requirements and prohibitions.

The Discharger is subject to the requirements of, and must comply with, State Water Board Order 2006-0003-DWQ, Statewide General Waste Discharge Requirements for Sanitary Sewer Systems, as amended by State Water Board Order WQ 2013-0058-EXEC and any subsequent order.

D. Impaired Water Bodies on CWA 303(d) List

1. Under section 303(d) of the 1972 CWA, states, territories and authorized tribes are required to develop lists of water quality limited segments. The waters on these lists do not meet water quality standards, even after point sources of pollution have installed the minimum required levels of pollution control technology. On 6 April 2016, U.S. EPA gave final approval to California's 2014 and 2016 section 303(d) List of Water Quality Limited Segments. The Basin Plan references this list of Water Quality Limited Segments (WQLSs), which are defined as "*...those sections of lakes, streams, rivers or other fresh water bodies where water quality does not meet (or is not expected to meet) water quality standards even after the application of appropriate limitations for point sources (40 C.F.R. part 130, et seq.).*" The Basin Plan also states, "*Additional treatment beyond minimum federal standards will be imposed on dischargers to [WQLSs]. Dischargers will be assigned or allocated a maximum allowable load of critical pollutants so that water quality objectives can be met in the segment.*" The listing for the Lower Feather River (Lake Oroville Dam to the confluence with the Sacramento River) includes: chlorpyrifos, Group A pesticides, mercury, polychlorinated biphenyls (PCB's), and toxicity.
2. **Total Maximum Daily Loads (TMDL's).** Table F-4, below, identifies the 303(d) listings and any applicable TMDL's. This permit includes WQBEL's that are consistent with the assumptions and considerations of the applicable WLAs in the Basin Plan Amendment for the Control of Diazinon and Chlorpyrifos Runoff into the Sacramento and Feather Rivers (see this Fact Sheet section IV.C.3).

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Table F-4. 303(d) List for the Lower Feather River

| Pollutant | Potential Sources | TMDL Status |
|--------------------|-------------------|--|
| Chlorpyrifos | Source Unknown | Adopted and Effective (11 August 2008) |
| Group A Pesticides | Source Unknown | Planned for Completion (2011) |
| Mercury | Source Unknown | Planned for Completion (2027) |
| PCB's | Source Unknown | Planned for Completion (2021) |
| Toxicity | Source Unknown | Planned for Completion (2027) |

3. The 303(d) listings and TMDL's have been considered in the development of the Order. A pollutant-by-pollutant evaluation of each pollutant of concern is described in section VI.C.3 of this Fact Sheet.

E. Other Plans, Policies, and Regulations

1. **Title 27.** The discharge authorized herein and the treatment and storage facilities associated with the discharge of treated municipal wastewater, except for discharges of residual sludge and solid waste, are exempt from the requirements of Title 27, California Code of Regulations (CCR), section 20005 *et seq* (hereafter Title 27). The exemption, pursuant to Title 27 CCR section 20090(a), is based on the following:
 - a. The waste consists primarily of domestic sewage and treated effluent;
 - b. The waste discharge requirements are consistent with water quality objectives; and
 - c. The treatment and storage facilities described herein are associated with a municipal wastewater treatment plant.

The Facility receives influent primarily from domestic sources and the Discharger is currently permitted to discharge up to 10.5 MGD of treated wastewater to a series of six unlined disposal ponds within the Feather River floodplain. Wastewater is left in the ponds to evaporate/percolate.

In order to qualify for an exemption from Title 27 under section 20090(b), the Discharger must demonstrate compliance with the Basin Plan, which requires that constituent concentrations in the groundwater do not exceed either the Basin Plan's groundwater water quality objectives or background groundwater concentrations, whichever is greater. The Discharger has a groundwater monitoring network that consists of eight monitoring wells (GW-001 through GW-008). According to the Discharger's 24 October 2008 Hydrogeologic Assessment Report, Yuba City Wastewater Treatment Facility (Kennedy/Jenks Consultants), monitoring wells GW-004, GW-005, and GW-006 are up gradient of the ponds and monitoring wells GW-001, GW-002, GW-003, and GW-008 are down gradient of the ponds. Monitoring well GW-007 is located on the opposite side of the river from the disposal ponds to monitor background concentrations.

Based on data collected between February 2004 and December 2004, the Central Valley Water Board determined in Order R5-2013-0094 that the discharges from the disposal ponds to groundwater were in compliance with the Basin Plan.

Based on groundwater monitoring conducted during the term of Order R5-2013-0094-01, this Order reaffirms that discharges from the ponds to groundwater are in compliance with the Basin Plan. Therefore, the discharges meet the pre-conditions for an exemption to the requirements of Title 27 pursuant to Title 27 CCR section 20090(b). This Order

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requires the Discharger to continue groundwater monitoring to evaluate impacts to groundwater and assure protection of beneficial uses.

IV. RATIONALE FOR EFFLUENT LIMITATIONS AND DISCHARGE SPECIFICATIONS

Effluent limitations and toxic and pretreatment effluent standards established pursuant to sections 301 (Effluent Limitations), 302 (Water Quality Related Effluent Limitations), 304 (Information and Guidelines), and 307 (Toxic and Pretreatment Effluent Standards) of the CWA and amendments thereto are applicable to the discharge.

The CWA mandates the implementation of effluent limitations that are as stringent as necessary to meet water quality standards established pursuant to state or federal law [33 U.S.C., §1311(b)(1)(C); 40 C.F.R. § 122.44(d)(1)]. NPDES permits must incorporate discharge limits necessary to ensure that water quality standards are met. This requirement applies to narrative criteria as well as to criteria specifying maximum amounts of particular pollutants. Pursuant to federal regulations, 40 C.F.R. section 122.44(d)(1)(i), NPDES permits must contain limits that control all pollutants that *“are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any state water quality standard, including state narrative criteria for water quality.”* Federal regulations, 40 C.F.R. section 122.44(d)(1)(vi), further provide that “[w]here a state has not established a water quality criterion for a specific chemical pollutant that is present in an effluent at a concentration that causes, has the reasonable potential to cause, or contributes to an excursion above a narrative criterion within an applicable State water quality standard, the permitting authority must establish effluent limits.”

The CWA requires point source dischargers to control the amount of conventional, non-conventional, and toxic pollutants that are discharged into the waters of the United States. The control of pollutants discharged is established through effluent limitations and other requirements in NPDES permits. There are two principal bases for effluent limitations in the Code of Federal Regulations: 40 C.F.R. section 122.44(a) requires that permits include applicable technology-based limitations and standards; and 40 C.F.R. section 122.44(d) requires that permits include WQBEL's to attain and maintain applicable numeric and narrative water quality criteria to protect the beneficial uses of the receiving water where numeric water quality objectives have not been established. The Basin Plan at page 4-27, contains an implementation policy, “Policy for Application of Water Quality Objectives” that specifies that the Central Valley Water Board *“will, on a case-by-case basis, adopt numerical limitations in orders which will implement the narrative objectives.”* This Policy complies with 40 C.F.R. section 122.44(d)(1). With respect to narrative objectives, the Central Valley Water Board must establish effluent limitations using one or more of three specified sources, including: (1) U.S. EPA's published water quality criteria, (2) a proposed state criterion (i.e., water quality objective) or an explicit state policy interpreting its narrative water quality criteria (i.e., the Central Valley Water Board's “Policy for Application of Water Quality Objectives”) (40 C.F.R. § 122.44(d)(1)(vi)(A), (B) or (C)), or (3) an indicator parameter.

The Basin Plan includes numeric site-specific water quality objectives and narrative objectives for toxicity, chemical constituents, discoloration, radionuclides, and tastes and odors. The narrative toxicity objective states: *“All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life.”* (Basin Plan at Section 3.1.20). The Basin Plan states that material and relevant information, including numeric criteria, and recommendations from other agencies and scientific literature will be utilized in evaluating compliance with the narrative toxicity objective. The narrative chemical constituents objective states that waters shall not contain chemical constituents in concentrations that adversely affect beneficial uses. At minimum, *“... water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels (MCLs)”* in Title 22 of CCR. The Basin Plan further states that, to

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protect all beneficial uses, the Central Valley Water Board may apply limits more stringent than MCLs. The narrative tastes and odors objective states: *“Water shall not contain taste- or odor-producing substances in concentrations that impart undesirable tastes or odors to domestic or municipal water supplies or to fish flesh or other edible products of aquatic origin, or that cause nuisance, or otherwise adversely affect beneficial uses.”*

A. Discharge Prohibitions

1. **Prohibition III.A (No discharge or application of waste other than that described in this Order).** This prohibition is based on Water Code section 13260 that requires filing of a ROWD before discharges can occur. The Discharger submitted a ROWD for the discharges described in this Order; therefore, discharges not described in this Order are prohibited.
2. **Prohibition III.B (No bypasses or overflow of untreated wastewater, except under the conditions at 40 C.F.R. section 122.41(m)(4)).** As stated in section I.G of Attachment D, Standard Provisions, this Order prohibits bypass from any portion of the treatment facility. Federal regulations, 40 C.F.R. section 122.41(m), define “bypass” as the intentional diversion of waste streams from any portion of a treatment facility. This section of the federal regulations, 40 C.F.R. section 122.41(m)(4), prohibits bypass unless it is unavoidable to prevent loss of life, personal injury, or severe property damage. In considering the Regional Water Board’s prohibition of bypasses, the State Water Board adopted a precedential decision, Order No. WQO 2002-0015, which cites the federal regulations, 40 C.F.R. section 122.41(m), as allowing bypass only for essential maintenance to assure efficient operation.
3. **Prohibition III.C (No controllable condition shall create a nuisance).** This prohibition is based on Water Code section 13050 that requires water quality objectives established for the prevention of nuisance within a specific area. The Basin Plan prohibits conditions that create a nuisance.
4. **Prohibition III.D (No discharge of hazardous waste).** This prohibition is based on California Code of Regulations, title 22, section 66261.1 et seq, that prohibits discharge of hazardous waste.
5. **Prohibition III.E (Average dry weather flow).** This prohibition is based on the design average dry weather flow treatment capacity rating for the Facility and ensures the Facility is operated within its treatment capacity. Previous Order R5-2013-0094-01 included flow as an effluent limit based on the facility design flow. Flow is not a pollutant and therefore has been changed from an effluent limit to a discharge prohibition in this Order, which is an equivalent level of regulation. This Order is not less stringent because compliance with flow as a discharge prohibition will be calculated the same way as the previous Order.
6. **Prohibition III.F (No discharge to the Feather River at Discharge Point 001 when depth of water over the diffuser is below an average of 0.8 feet).** The Feather River has at Shanghai Falls eroded to form a new path for water as a result of storm events in 2011, 2016/2017, and the Oroville Dam Incident. At normal non-storm event flows, the diffuser is not submerged. In order to ensure that discharges to the Feather River via the diffuser at Discharge Point 001 receive adequate dilution, this Order prohibits discharges at Discharge Point 001 when the depth of water over the diffuser is less than an average of 0.8 feet, which corresponds to a receiving water flow of approximately 10,000 cfs.

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B. Technology-Based Effluent Limitations

1. Scope and Authority

Section 301(b) of the CWA and implementing U.S. EPA permit regulations at 40 C.F.R. section 122.44 require that permits include conditions meeting applicable technology-based requirements at a minimum, and any more stringent effluent limitations necessary to meet applicable water quality standards. The discharge authorized by this Order must meet minimum federal technology-based requirements based on Secondary Treatment Standards at 40 C.F.R. part 133.

Regulations promulgated in 40 C.F.R. section 125.3(a)(1) require technology-based effluent limitations for municipal Dischargers to be placed in NPDES permits based on Secondary Treatment Standards or Equivalent to Secondary Treatment Standards.

The Federal Water Pollution Control Act Amendments of 1972 (PL 92-500) established the minimum performance requirements for POTW's [defined in section 304(d)(1)]. Section 301(b)(1)(B) of that Act requires that such treatment works must, as a minimum, meet effluent limitations based on secondary treatment as defined by the U.S. EPA Administrator.

Based on this statutory requirement, U.S. EPA developed secondary treatment regulations, which are specified in 40 C.F.R. part 133. These technology-based regulations apply to all municipal wastewater treatment plants and identify the minimum level of effluent quality attainable by secondary treatment in terms of BOD₅, total suspended solids (TSS), and pH.

2. Applicable Technology-Based Effluent Limitations

- a. **BOD₅ and TSS.** Federal regulations at 40 C.F.R. part 133, establish the minimum weekly and monthly average level of effluent quality attainable by secondary treatment for BOD₅ and TSS. In addition, 40 C.F.R. section 133.102, in describing the minimum level of effluent quality attainable by secondary treatment, states that the 30-day average percent removal shall not be less than 85 percent. This Order contains a limitation requiring an average of 85 percent removal of BOD₅ and TSS over each calendar month.
- b. **pH.** The secondary treatment regulations at 40 C.F.R. part 133 also require that pH be maintained between 6.0 and 9.0 standard units. This Order, however, requires more stringent WQBEL's for pH to comply with the Basin Plan's water quality objectives for pH.

Summary of Technology-based Effluent Limitations Discharge Points 001and 002

Table F-5. Summary of Technology-based Effluent Limitations

| Parameter | Units | Effluent Limitations | | | | |
|--|----------------------|----------------------|----------------|---------------|-----------------------|-----------------------|
| | | Average Monthly | Average Weekly | Maximum Daily | Instantaneous Minimum | Instantaneous Maximum |
| Conventional Pollutants | | | | | | |
| Biochemical Oxygen Demand (5-day @ 20°C) | mg/L | 30 | 45 | 60 | -- | -- |
| | lbs/day ¹ | 2,600 | 3,900 | 5,300 | -- | -- |
| | % Removal | 85 | -- | -- | -- | -- |
| pH ² | standard units | -- | -- | -- | 6.0 | 9.0 |
| | mg/L | 30 | 45 | 60 | -- | -- |

| Parameter | Units | Effluent Limitations | | | | |
|--|----------------------|----------------------|----------------|---------------|-----------------------|-----------------------|
| | | Average Monthly | Average Weekly | Maximum Daily | Instantaneous Minimum | Instantaneous Maximum |
| Biochemical Oxygen Demand (5-day @ 20°C) | lbs/day ¹ | 2,600 | 3,900 | 5,300 | -- | -- |
| | % Removal | 85 | -- | -- | -- | -- |

¹ Based on a design average dry weather flow of 10.5 MGD.

² Note that more stringent WQBEL's for pH are applicable and are established as final effluent limitations in this Order (see section IV.C.3 of this Fact Sheet).

C. Water Quality-Based Effluent Limitations (WQBEL's)

1. Scope and Authority

CWA Section 301(b) and 40 C.F.R. section 122.44(d) require that permits include limitations more stringent than applicable federal technology-based requirements where necessary to achieve applicable water quality standards.

Section 122.44(d)(1)(i) of 40 C.F.R. requires that permits include effluent limitations for all pollutants that are or may be discharged at levels that have the reasonable potential to cause or contribute to an exceedance of a water quality standard, including numeric and narrative objectives within a standard. Where reasonable potential has been established for a pollutant, but there is no numeric criterion or objective for the pollutant, WQBEL's must be established using: (1) U.S. EPA criteria guidance under CWA section 304(a), supplemented where necessary by other relevant information; (2) an indicator parameter for the pollutant of concern; or (3) a calculated numeric water quality criterion, such as a proposed state criterion or policy interpreting the state's narrative criterion, supplemented with other relevant information, as provided in section 122.44(d)(1)(vi).

The process for determining reasonable potential and calculating WQBEL's when necessary is intended to protect the designated uses of the receiving water as specified in the Basin Plan, and achieve applicable water quality objectives and criteria that are contained in other state plans and policies, or any applicable water quality criteria contained in the CTR and NTR.

Finally, 40 C.F.R. section 122.44(d)(1)(vii) requires effluent limits to be developed consistent with any available wasteload allocations developed and approved for the discharge.

2. Applicable Beneficial Uses and Water Quality Criteria and Objectives

The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters addressed through the plan. In addition, the Basin Plan implements State Water Board Resolution No. 88-63, which established state policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply.

The Basin Plan on page 2-1 states: "*Protection and enhancement of existing and potential beneficial uses are primary goals of water quality planning...*" and with respect to disposal of wastewaters states that "*...disposal of wastewaters is [not] a prohibited use of waters of the State; it is merely a use which cannot be satisfied to the detriment of beneficial uses.*"

The federal CWA section 101(a)(2), states: "*it is the national goal that wherever attainable, an interim goal of water quality which provides for the protection and*

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propagation of fish, shellfish, and wildlife, and for recreation in and on the water be achieved by July 1, 1983.” Federal Regulations, developed to implement the requirements of the CWA, create a rebuttable presumption that all waters be designated as fishable and swimmable. Federal Regulations, 40 C.F.R. sections 131.2 and 131.10, require that all waters of the State regulated to protect the beneficial uses of public water supply, protection and propagation of fish, shell fish and wildlife, recreation in and on the water, agricultural, industrial and other purposes including navigation. 40 C.F.R. section 131.3(e) defines existing beneficial uses as those uses actually attained after 28 November 1975, whether or not they are included in the water quality standards. Federal Regulation, 40 C.F.R. section 131.10 requires that uses be obtained by implementing effluent limitations, requires that all downstream uses be protected and states that in no case shall a state adopt waste transport or waste assimilation as a beneficial use for any waters of the United States.

- a. **Receiving Water and Beneficial Uses.** The Discharger discharges to the Feather River a Discharge Points 001 via an in-stream diffuser and 002 the disposal ponds. The discharge to the Feather River is approximately 20 miles above the confluence with the Sacramento River and 25 miles north of Sacramento. Both the Feather and Yuba Rivers have major dams and are used to convey water. Low flow periods typically occur in the non-storm periods of winter due to the low demand for water. The Feather River is controlled by the Oroville Dam and Thermalito Afterbay and operated to maintain minimum flowrates per agreement between the California Department of Water Resources and Department of Fish and Wildlife. The Yuba River flowrates are controlled by New Bullards Bar and Englebright dams operated to meet the 2007 Lower Yuba River Accord (LYRA).

In October 2011, river flows eroded Shanghai Falls to form a new path for water, routing the water through a narrow center section of the falls. Shanghai Falls also moved upstream of the current diffuser location. Prior to October 2011, Shanghai Falls were over 200 feet downstream of the diffuser. The channel has continued to change and divert water away from the existing diffuser location. Significant channel erosion took place in 2017 during releases from the Oroville Dam spillway when flows were as high as 150,000 cfs (Oroville Dam Incident).

Refer to III.C.1. above for a complete description of the receiving water and beneficial uses.

- b. **Effluent and Ambient Background Data.** The reasonable potential analysis (RPA), as described in section IV.C.3 of this Fact Sheet, was based on data collected at Monitoring Location EFF-001/EFF-002 prior to discharges at Discharge Point 001 and 002 from June 2013 through May 2017 which includes effluent and ambient background data submitted in SMR's.
- c. **Assimilative Capacity/Mixing Zone**
- i. **Regulatory Guidance for Dilution Credits and Mixing Zones.** The CWA directs the states to adopt water quality standards to protect the quality of its waters. U.S. EPA's current water quality standards regulation authorizes states to adopt general policies, such as mixing zones, to implement state water quality standards (40 C.F.R. § 122.44 and 122.45). The U.S. EPA allows states to have broad flexibility in designing its mixing zone policies. Primary policy and guidance on determining mixing zone and dilution credits is provided by the SIP and the Basin Plan. If no procedure applies in the SIP or the Basin Plan, then the Central Valley Water Board may use the U.S. EPA *Technical*

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*Support Document for Water Quality-Based Toxics Control
(EPA/505/2-90-001) (TSD).*

For non-priority pollutant constituents the allowance of mixing zones by the Central Valley Water Board is discussed in the Basin Plan, *Policy for Application of Water Quality Objectives*, which states in part, “*In conjunction with the issuance of NPDES and storm water permits, the Regional Board may designate mixing zones within which water quality objectives will not apply provided the discharger has demonstrated to the satisfaction of the Regional Board that the mixing zone will not adversely impact beneficial uses. If allowed, different mixing zones may be designated for different types of objectives, including, but not limited to, acute aquatic life objectives, chronic aquatic life objectives, human health objectives, and acute and chronic whole effluent toxicity objectives, depending in part on the averaging period over which the objectives apply. In determining the size of such mixing zones, the Regional Board will consider the applicable procedures and guidelines in the EPA’s Water Quality Standards Handbook and the [TSD]. Pursuant to EPA guidelines, mixing zones designated for acute aquatic life objectives will generally be limited to a small zone of initial dilution in the immediate vicinity of the discharge.*”

For priority pollutants, the SIP supersedes the Basin Plan mixing zone provisions. Section 1.4.2 of the SIP states, in part, “*...with the exception of effluent limitations derived from TMDL’s, in establishing and determining compliance with effluent limitations for applicable human health, acute aquatic life, or chronic aquatic life priority pollutant criteria/objectives or the toxicity objective for aquatic life protection in a basin plan, the Regional Board may grant mixing zones and dilution credits to dischargers...The applicable priority pollutant criteria and objectives are to be met through a water body except within any mixing zone granted by the Regional Board. **The allowance of mixing zones is discretionary and shall be determined on a discharge-by-discharge basis.** The Regional Board may consider allowing mixing zones and dilution credits only for discharges with a physically identifiable point of discharge that is regulated through an NPDES permit issued by the Regional Board.*” [emphasis added]

For incompletely-mixed discharges, the Discharger must complete an independent mixing zone study to demonstrate to the Central Valley Water Board that a dilution credit is appropriate. In granting a mixing zone, Section 1.4.2.2 of the SIP requires the following to be met:

“A mixing zone shall be as small as practicable. The following conditions must be met in allowing a mixing zone: [emphasis added]

A: A mixing zone shall not:

1. compromise the integrity of the entire water body;
2. cause acutely toxic conditions to aquatic life passing through the mixing zone;
3. restrict the passage of aquatic life;
4. adversely impact biologically sensitive or critical habitats, including, but not limited to, habitat of species listed under federal or State endangered species laws;

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5. produce undesirable or nuisance aquatic life;
6. result in floating debris, oil, or scum;
7. produce objectionable color, odor, taste, or turbidity;
8. cause objectionable bottom deposits;
9. cause nuisance;
10. dominate the receiving water body or overlap a mixing zone from different outfalls; or
11. be allowed at or near any drinking water intake. A mixing zone is not a source of drinking water. To the extent of any conflict between this determination and the Sources of Drinking Water Policy (Resolution No. 88-63), this SIP supersedes the provisions of that policy.”

Section 1.4.2.1 of the SIP establishes the authority for the Central Valley Water Board to consider dilution credits based on the mixing zone conditions in a receiving water. Section 1.4.2.1 in part states:

*“The dilution credit, D, is a numerical value associated with the mixing zone that accounts for the receiving water entrained into the discharge. The dilution credit is a value used in the calculation of effluent limitations (described in Section 1.4). **Dilution credits may be limited or denied on a pollutant-by-pollutant basis, which may result in a dilution credit for all, some, or no priority pollutants in the discharge.**”* [emphasis added]

The mixing zone is thus an administrative construct defined as an area around the outfall that may exceed water quality objectives but is otherwise protective of the beneficial uses. Dilution is defined as the amount of mixing that has occurred at the edge of this mixing zone under critical conditions, thus protecting the beneficial uses at the concentration and for the duration and frequency required.

- ii. **2007 Mixing Zone and Dilution Credits.** Flows in the Feather River originate in the Sierras and converge in the Lake Oroville Reservoir, located 5 miles northeast of Oroville. From the reservoir, the Feather River flows south across the Sacramento Valley, east of Sutter Buttes past Oroville and Yuba City and Marysville and joins the Sacramento River from the north. The Yuba River and Bear River are tributary to the Feather River east and south of Yuba City, respectively. Flow in the Feather River at the point of discharge from the Facility is affected by upstream flow in the Feather River, as well as flow in the Yuba River. Due to concerns over low flow conditions that could occur below historical levels in the Feather River at the point of discharge from the Facility, the Discharger completed a technical report assessing the impact of full utilization of water right withdrawals on critical low flows on 5 December 2003. According to the report, the Feather and Yuba Rivers are operated to maintain minimum flow rates regardless of flow diversions. The flow of the Feather River is operated in accordance with a 26 August 1983 agreement between the Department of Water Resources (DWR) and the California Department of Fish and Wildlife (DFW) entitled “*Concerning the Operation of the Oroville Division of the State Water Project for Management of Fish and Wildlife.*” This agreement states that a minimum flow of 1,000 cfs must be maintained by releases from the Oroville Reservoir (Thermolito Diversion Dam) along all stretches of the Feather River from the Thermolito Afterbay to the mouth of the

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Feather River at Verona. Releases from the reservoir are limited to prevent water elevations in the reservoir to fall below 733 feet. When releases are limited, the Feather River flow could be as low as 750 cfs. The flow in the Yuba River is controlled under the 1 March 2001 State Water Board Decision 1644. Under this decision, flows in the Yuba River are to be maintained at 250 cfs except under hydrologic critical years, where the flow at Marysville will be 100 cfs.

Concurrent with the development of Order R5-2007-0134, the Discharger requested dilution credits for a number of parameters. The Discharger supported the request with a number of technical reports related to evaluation of the mixing zone in the vicinity of the discharge to the Feather River. The Discharger used the Cornell Mixing Zone Expert System (CORMIX) to model the dilution characteristics of the Facility discharge to the Feather River through the diffuser. As a result of the review of these studies, the Central Valley Water Board granted mixing zones and dilution credits in Order R5-2007-0134 as summarized in the table below.

Table F-6. Regulatory Mixing Zone Sizes and Dilution

| Regulatory Mixing Zone Sizes and Dilution | River Flowrate (cfs) | Effluent Flowrate (MGD) | Distance Downstream (feet) | Dilution (D) ¹ |
|---|----------------------|-------------------------|----------------------------|---------------------------|
| Acute | 1,000 | 15.2 | 8 ² | 11 |
| Chronic | 1,000 | 14.3 | 160 ³ | 12 |
| Human Health | 3,600 ⁴ | 10.5 | 1,200 | 221 |

¹ Dilutions evaluated at receiving water and effluent flowrates specified in Table 3 of the SIP.

² Distance to zone of initial dilution at 1Q10 flowrate of 1,000 cfs.

³ Nominal distance from diffuser to lip of Shanghai Falls (Larry Walker Associates, "CORMIX Updates for 3-Year Data Window and Future Critical Flows", Technical Memorandum to Bill Lewis, Maria Solis, and Michael Paulucci of the Yuba City WRP, dated January 29, 2007).

⁴ Calculated harmonic mean flowrate.

- iii. **2013 Mixing Zone and Dilution Credits.** In October 2011, partial collapse of the rock shelf which comprised Shanghai Falls occurred. The rock shelf restricted the river flow at Shanghai Falls which resulted in higher upstream river surface elevations than would otherwise occur. After the collapse of Shanghai Falls, the surface elevation of the river dropped such that the diffuser was no longer submerged beneath the Feather River year-round.

To support continuation of the dilution credits granted in Order R5-2007-0134-01 in light of the 2011 changes to the Feather River in the vicinity of Discharge Point 001, the Discharger provided additional information in the 3 April 2012 ROWD and in a 11 September 2012 *2012 CORMIX Update for Current Diffuser in the Feather River* (Larry Walker Associates) (referred to as 2012 CORMIX Update Study). Previous CORMIX modeling determined flow of an average of 0.8 feet of water over the diffuser as the level of critical low flow depth. The 2012 CORMIX Update Study maintained the critical low flow depth of an average of 0.8 feet over the diffuser but with an increase in the minimum flow required (i.e., 6,500 cfs) to match the new flow regime where an average of 0.8 feet over the diffuser was maintained. All other data was maintained from the previous CORMIX modeling with the exceptions of the following, which were updated to reflect updated information:

- (a) As documented in the 3 March 2011 *Analysis of Minimum Flows Expected in the Feather River and the Yuba River in the Vicinity of Yuba City* (Larry

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Walker Associates), the Discharger conservatively estimated the 1Q10 and 7Q10 flow rates at 1,200 cfs and 1,236 cfs, respectively (and based on the operations agreements for Oroville Reservoir and Thermolito Afterbay on the Feather River and the New Bullard Bar Reservoir on the Yuba River).

- (b) As documented in the 12 October 2012 Harmonic Mean Flowrate and Human Health Dilution Update (Larry Walker Associates), the harmonic mean flow was updated based on data from October 1968 through October 2012 using data collected by the United States Geological Survey (USGS) and DWR for the Feather River at Gridley and the Yuba River at Marysville. The harmonic mean calculated from the updated dataset is 3,612 cfs.

As shown in the table below, the 2012 CORMIX Update Study demonstrated that the resulting dilutions associated with the minimum flow required (i.e., 6,500 cfs) were greater than those used as the basis for the dilution credits provided under Order R5-2007-0134-01.

Table F-7. Comparison of Mixing Zone Dilution Ratios in the 2012 CORMIX Update Study to Order R5-2013-0094

| Regulatory Mixing Zone | Dilution (D) Under Revised Feather River Flow Regime | Dilution (D) Under Order R5-2007-0134-01 |
|------------------------|--|--|
| Acute | 51 | 11 |
| Chronic | 56 | 12 |
| Human Health | 222 | 221 |

According to the 2012 CORMIX Update Study, the diffuser was submerged when flows in Feather River exceeded 4,650 cfs and was exposed to the atmosphere when flows were less than 4,650 cfs. Based on the new flow regime, the CORMIX model was run by the Discharger for receiving water flow rates ranging from 5,500 cfs to 7,500 cfs. At a receiving water flow of 6,500 cfs (corresponding to a river depth submerging the diffuser in an average of 0.8 feet of water, that represents the water depth that used to occur at the critical river flowrate), the model estimated that the water column would be completely mixed at a distance of 4.0 feet from the diffuser (which represents a shorter distance to achieve complete mixing when compared to the acute mixing zone of 8 feet as established in Order R5-2007-0134-01).

Based on the results of the 2012 CORMIX Update Study, the Central Valley Water Board retained the dilution factors granted under Order R5-2007-0134-01 in Order R5-2013-0094-01 and prohibited discharges to the river when the depth of water over the diffuser is below an average of 0.8 feet.

- iv. **Applicability of Existing Mixing Zone and Dilution Credits.** Significant channel erosion took place in during the Oroville Dam Incident where releases from the Oroville Dam spillway resulted in flows as high as 150,000 cfs in the Feather River at Discharge Point 001. Currently, the diffuser is adequately submerged (i.e., average depth of 0.8 feet over the diffuser) at flows of approximately 10,000 cfs. The flowrate required to submerge the diffuser has continued to increase as the river channel erodes and may increase further in the future.

Given the uncertainty of possible changes to the river bed configuration in the future, use of a water level trigger of an average of 0.8 feet over the diffuser will

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ensure that adequate river flow is available to mix with the Facility effluent and protect aquatic life and human health.

Since the proposed water level trigger requires significantly higher flow rates for discharges at Discharge Point 001 to occur (greater than 10,000 cfs as of adoption of this Order), significantly more dilution will be available when discharging than the assumptions on which the dilution credits allowed in Order R5-2007-0134-01 and the 2012 CORMIX Update Study were based. Given that no change has been requested for the existing dilution credits, the conditions stipulated in the SIP for granting dilution credits (e.g., the mixing zone will not cause acutely toxic conditions to aquatic life passing through the mixing zone) will continue to be met under the new flow regime and discharge flow (based on the water level trigger). In addition, the discharge of effluent will only be allowed during receiving water flows which substantially exceed the critical low flows.

As described previously in Section II.E of this Fact Sheet, the Discharger is proposing to locate and install a new diffuser within the next 5 years downstream of the Shanghai Falls in the deeper more stable stretch of the river to allow the Discharger to regain the ability to discharge to the river under all flow conditions. Prior to discharging at the new location, the Discharger must submit a new mixing zone study, antidegradation analysis, and ROWD.

Consistent with Orders R5-2007-0134-01 and R5-2013-0094-01, this Order applies the same dilution credits at Discharge Points 001 and 002. The Discharger submitted a 23 October 2008 Disposal Pond Study that concluded that the effluent limitations for discharges to the ponds established with the same dilution credits as Discharge Point 001 are protective of water quality objectives when the ponds are inundated. Although evaporation does increase constituent concentrations in the ponds, the significant amounts of dilution available during flood stages reduces the constituent concentrations when the ponds are inundated.

- v. **Evaluation of Available Dilution for Acute and Chronic Aquatic Life Criteria.** U.S. EPA Region VIII, in its *"EPA Region VIII Mixing Zones and Dilution Policy"*, recommends no dilution for acute aquatic life criteria, stating the following, *"In incomplete mix situations, discharge limitations to implement acute chemical-specific aquatic life criteria and narrative (no acute toxicity) criteria shall be based on achieving such acute criteria at the end-of-pipe (i.e., without an allowance for dilution). This approach is intended to implement the narrative requirement prohibiting acutely toxic conditions in the mixing zone."*

The Discharger has requested acute and chronic aquatic life mixing zones for compliance with acute and chronic water quality criteria for ammonia and copper. Based on the mixing zone studies, the requested acute and chronic mixing zones are 8 feet and 160 feet downstream, respectively.

The acute and chronic aquatic life mixing zones meet the requirements of the SIP as follows:

- (a) Shall not compromise the integrity of the entire water body – The TSD states that, "If the total area affected by elevated concentrations within all mixing zones combined is small compared to the total area of a water body (such as a river segment), then mixing zones are likely to have little effect on the integrity of the water body as a whole, provided that the

mixing zone does not impinge on unique or critical habitats.”¹ The mixing zones are small and make up less than one-half of the stream width. The aquatic life mixing zones do not compromise the integrity of the entire water body.

- (b) *Shall not cause acutely toxic conditions to aquatic life passing through the mixing zone* – The SIP requires that the acute mixing zone be appropriately sized to prevent lethality to organisms passing through the mixing zone. U.S. EPA recommends that float times through a mixing zone less than 15 minutes ensure that there will not be lethality to passing organisms. The acute mixing zone extends 8 feet downstream of the diffuser. The Discharger’s previous CORMIX studies calculated the time required to reach the end of the acceleration zone, and conservatively estimated travel times by directly proportioning the time required with the fraction of the total acceleration zone distance. For the case of the 1Q10 of 1,000 cfs and peak day effluent flowrate of 15.2 MGD, the acceleration zone is approximately 80 feet long and CORMIX calculates the total travel time to be 28 seconds. The conservative estimate of the time required to traverse the 4 feet from the diffuser to the 5 river depths length scale distance would be estimated as 28 seconds times (4 feet divided by 80 feet), which equals 1.4 seconds. Likewise, the distance to reach the end of the zone of initial mixing (8 feet for these conditions) would conservatively require 2.8 seconds. The estimates are conservative because the water velocity closer to the diffuser would be greater. Velocity decreases as momentum dissipates and the plume mixes. However, neglecting the acceleration provided by the momentum of the discharged effluent, the Discharger estimated that the travel time to traverse 8.5 feet is 4.5 seconds, which is still considerably smaller than U.S. EPA’s recommendation of less than 15-minute exposure. Furthermore, this Order includes acute toxicity effluent limitations that require compliance to be determined based on acute bioassays using 100 percent effluent. Compliance with these requirements ensures that acute toxic conditions to aquatic life passing through the acute and chronic mixing zones do not occur.
- (c) *Shall not restrict the passage of aquatic life* – The Discharger’s evaluated the availability of a zone of passage around the mixing zones in Attachment C of the 18 July 2006 ROWD and in a 29 January 2007 technical memorandum *CORMIX Updates for 3-Year Data Window and Future Critical Flows*. Based on review of these reports, the Central Valley Water Board concludes that an adequate zone of passage for aquatic organisms exists.
- (d) *Shall not adversely impact biologically sensitive or critical habitats, including, but not limited to, habitat of species listed under federal or state endangered species laws* – The acute and chronic mixing zones will not cause acutely toxic conditions, allow adequate zones of passage, and are sized appropriately to ensure that there will be no adverse impacts to biologically sensitive or critical habitats.
- (e) *Shall not produce undesirable or nuisance aquatic life; result in floating debris, oil, or scum; produce objectionable color, odor, taste, or turbidity;*

¹ TSD, pg. 33

cause objectionable bottom deposits; cause nuisance – The current discharge has not been shown to result in floating debris, oil, or scum; produce objectionable color, odor, taste, or turbidity; cause objectionable bottom deposits; or cause nuisance.

- (f) Shall not dominate the receiving water body or overlap a mixing zone from different outfalls – The acute and chronic mixing zones are small relative to the water body, so they will not dominate the water body. The outfall is located approximately 3,400 feet downstream of the Linda County Water District Wastewater Treatment Plant (WWTP) outfall, for which the Central Valley Water Board has not authorized aquatic life mixing zones in Order R5-2017-0094. There are no other outfalls or mixing zones in the vicinity of the discharge.
- (g) Shall not be allowed at *or near any drinking water intake* – The acute and chronic mixing zones are not near a drinking water intake.

The acute and chronic aquatic life mixing zones, therefore, comply with the SIP. The mixing zones also comply with the Basin Plan, which requires that the mixing zones not adversely impact beneficial uses. Beneficial uses will not be adversely affected for the same reasons discussed above. In determining the size of the mixing zones, the Central Valley Water Board considered the procedures and guidelines in U.S. EPA's *Water Quality Standards Handbook, 2nd Edition* (updated July 2007), section 5.1, and section 2.2.2 of the TSD. The SIP incorporates the same guidelines.

- vi. **Evaluation of Available Dilution for Human Health Criteria.** Section 1.4.2.2 of the SIP provides that mixing zones should not be allowed at or near drinking water intakes. Furthermore, regarding the application of a mixing zone for the protection of human health, the TSD states that, "...the presence of mixing zones should not result in significant health risks, when evaluated using reasonable assumptions about exposure pathways. Thus, where drinking water contaminants are a concern, mixing zones should not encroach on drinking water intakes." There are no drinking water intakes in the human health mixing zone.

The Discharger has requested a human health mixing zone for compliance with human health water quality criteria for dichlorobromomethane. Based on the mixing zone studies, the requested human health mixing zone is 1,200 feet downstream.

The human health mixing zone meets the requirements of the SIP as follows:

- (a) Shall not compromise the integrity of the entire water body – The TSD states that, "If the total area affected by elevated concentrations within all mixing zones combined is small compared to the total area of a water body (such as a river segment), then mixing zones are likely to have little effect on the integrity of the water body as a whole, provided that the mixing zone does not impinge on unique or critical habitats."² The human health mixing zone is not applicable to aquatic life criteria. The human health mixing zone does not compromise the integrity of the entire water body.

² TSD, pg. 33

- (b) Shall not cause acutely toxic conditions to aquatic life passing through the mixing zone – The human health mixing zone is not applicable to aquatic life criteria. Therefore, acutely toxic conditions will not occur in the mixing zone.
- (c) Shall not restrict the passage of aquatic life – The human health mixing zone is not applicable to aquatic life criteria. Therefore, the mixing zone will not restrict the passage of aquatic life.
- (d) Shall not adversely impact biologically sensitive or critical habitats, including, but not limited to, habitat of species listed under federal or State endangered species laws – The human health mixing zone is not applicable to aquatic life criteria. The mixing zone will not impact biologically sensitive or critical habitats.
- (e) Shall not produce undesirable or nuisance aquatic life; result in floating debris, oil, or scum; produce objectionable color, odor, taste, or turbidity; cause objectionable bottom deposits; cause nuisance – The allowance of a human health mixing zone will not produce undesirable or nuisance aquatic life, result in floating debris, oil, or scum; produce objectionable color, odor, taste, or turbidity; cause objectionable bottom deposits; or cause nuisance.
- (f) Shall not dominate the receiving water body or overlap a mixing zone from different outfalls – The human health mixing zone is small relative to the water body, so it will not dominate the water body. Furthermore, the mixing zone does not overlap mixing zones from other outfalls. The outfall is located approximately 3,400 feet downstream of the Linda County Water District WWTP's outfall. The proposed mixing zone does not overlap with the human health mixing zone from the upstream outfall. There are no other outfalls or mixing zones in the vicinity of the discharge.
- (g) *Shall not be allowed at or near any drinking water intake* – The human health mixing zone is not near a drinking water intake.

The human health mixing zone, therefore, complies with the SIP. The mixing zone also complies with the Basin Plan, which requires that the mixing zone not adversely impact beneficial uses. Beneficial uses will not be adversely affected for the same reasons discussed above. In determining the size of the mixing zone, the Central Valley Water Board considered the procedures and guidelines in U.S. EPA's *Water Quality Standards Handbook, 2nd Edition* (updated July 2007), section 5.1, and section 2.2.2 of the TSD. The SIP incorporates the same guidelines.

- vii. **Evaluation of Available Dilution for Specific Constituents (Pollutant-by-Pollutant Evaluation).** As discussed in section IV.C.3 of this Fact Sheet, based on existing effluent data, it appears the Facility cannot meet the end-of-pipe (no dilution) WQBEL's for ammonia, copper, and dichlorobromomethane.

The allowance of a mixing zone and dilution credits is a discretionary act by the Central Valley Water Board. When determining the appropriate dilution credits for a specific pollutant, several factors must be considered, such as available assimilative capacity, Facility performance, and best practicable treatment or control (BPTC). The Central Valley Water Board has determined the allowable dilution credits on a constituent-by-constituent basis.

The receiving water contains assimilative capacity for ammonia, copper, and dichlorobromomethane. As discussed above, acute, chronic and human health mixing zones with associated dilution credits of 11, 12, and 221, respectively, meet the mixing zone conditions specified in section 1.4.2.2.A of the SIP. However, an overarching mixing zone condition is that *“A mixing zone shall be as small as practicable.”*, and section 1.4.2.2.B requires, *“The RWQCB shall deny or significantly limit a mixing zone and dilution credits as necessary to protect beneficial uses, meet the conditions of this Policy, or comply with other regulatory requirements.”*

The Central Valley Water Board considered Facility performance and the receiving water’s assimilative capacity in determining the dilution needed. The consideration of these factors is necessary to avoid allocating an unnecessarily large portion of the receiving water’s assimilative capacity and possibly violating the Antidegradation Policy. Effluent data from the current permit term indicates that effluent concentrations for dichlorobromomethane are well below the WQBEL’s derived with the granted dilution credit. Based on this analysis, the full dilution credit is not necessary for dichlorobromomethane, and this Order does not grant the full extent of the requested mixing zone. Allowing dilution results in a higher concentration of dichlorobromomethane in discharges from Discharge Point 001 and a higher loading to the Feather River. Therefore, in lieu of allowing the full dilution credit for dichlorobromomethane, this Order retains the performance-based effluent limitations that were established in Order R5-2013-0094-01, with which the Discharger is able to comply, as shown in the following table (also discussed further in section IV.C.3).

Table F-8. Dilution Credits Associated with Performance-based Effluent Limitations

| Pollutant | Units | ECA ¹ | Criterion | Background | Dilution Credit ² |
|----------------------|-------|------------------|-----------|------------|------------------------------|
| Dichlorobromomethane | µg/L | 10 | 0.56 | <0.16 | 16.9 |

¹ Equivalent to the performance-based AMEL (determined using the 99th percentile concentration).

² The dilution credit is calculated using the steady-state mass balance equation rearranged to solve for the dilution credit, as follows:

$$D = (ECA - C) / (C - B)$$

As described further in section IV.C.2.f below, the Discharger performed dynamic modeling to serve as the basis for WQBEL’s established under Order R5-2007-0134-01 for ammonia and copper. In performing the dynamic modeling, the mixing zone dimensions serve as the point of compliance with water quality criteria. The dynamic model specifically determines the long-term average constituent concentration that would comply with the applicable water quality standards at the edge of the mixing zones. As the mixing zones from Orders R5-2007-0134-01 and R5-2013-0094-01 are conservatively being retained in this Order until the new downstream effluent diffuser is installed, this Order retains effluent limitations based on dynamic modeling results for ammonia and copper.

viii. **Regulatory Compliance for Dilution Credits and Mixing Zones.** To fully comply with all applicable laws, regulations and policies of the State, Central Valley Water Board approved a mixing zone and the associated dilution credits shown in Table F-8 based on the following:

(a) Mixing zones are allowed under the SIP provided all elements contained in Section 1.4.2.2 are met. Based on the mixing zone study conducted by

the Discharger the Central Valley Water Board has determined that these factors are met.

- (b) Section 1.4.2.2. of the SIP requires mixing zones to be as small as practicable. Based on the mixing zone study conducted by the Discharger the Central Valley Water Board has determined the mixing zone is as small as practicable.
- (c) In accordance with Section 1.4.2.2 of the SIP, the Board has determined the mixing zone is as small as practicable, will not compromise the integrity of the entire water body, restrict the passage of aquatic life, dominate the water body or overlap existing mixing zones from different outfalls. The mixing zones are small relative to the large size of the receiving water, are not at or near a drinking water intake, and do not overlap a mixing zone from a different outfall.
- (d) The Central Valley Water Board is allowing mixing zones for acute aquatic life, chronic aquatic life, and human health constituents, and has determined allowing such mixing zones will not cause acutely toxic conditions to aquatic life passing through the mixing zone.
- (e) The Central Valley Water Board has determined the discharge will not adversely impact biologically sensitive or critical habitats, including, but not limited to, habitat of species listed under the federal or state endangered species laws, because the mixing zones are relatively small and acutely toxic conditions will not occur in the mixing zones. The discharge will not produce undesirable or nuisance aquatic life, result in floating debris, oil, or scum, produce objectionable odor, taste, or turbidity, cause objectionable bottom deposits, or cause nuisance, because the Order establishes end-of-pipe effluent limitations (e.g., for BOD5 and TSS) and discharge prohibitions to prevent these conditions from occurring.
- (f) As required by the SIP, in determining the extent of or whether to allow a mixing zone and dilution credit, the Central Valley Water Board has considered the presence of pollutants in the discharge that are carcinogenic, mutagenic, teratogenic, persistent, bioaccumulative, or attractive to aquatic organisms, and concluded that the allowance of the mixing zone and dilution credit is adequately protective of the beneficial uses of the receiving water.
- (g) The Central Valley Water Board has determined mixing zone complies with the SIP for priority pollutants.
- (h) Section 1.4.2.2B of the SIP, in part states, "The RWQCB shall deny or significantly limit a mixing zone and dilution credits as necessary to protect beneficial uses, meet the conditions of this Policy, or comply with other regulatory requirements." The Central Valley Water Board has determined full allowance of dilution is not needed or necessary for the Discharger to achieve compliance with effluent limitations for all constituents in this Order.
- (i) The Central Valley Water Board has determined the mixing zones comply with the Basin Plan for non-priority pollutants. The Basin Plan requires a mixing zone not adversely impact beneficial uses. Beneficial uses will not be adversely affected for the same reasons discussed above. In

determining the size of the mixing zone, the Central Valley Water Board has considered the procedures and guidelines in Section 5.1 of U.S. EPA's Water Quality Standards Handbook, 2nd Edition (updated July 2007) and Section 2.2.2 of the TSD. The SIP incorporates the same guidelines.

- (j) The Central Valley Water Board has determined that allowing dilution factors that exceed those proposed by this Order would not comply with the State Antidegradation Policy for receiving waters outside the allowable mixing zone for ammonia, copper, and dichlorobromomethane. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16 (State Antidegradation Policy). The State Antidegradation Policy incorporates the federal antidegradation policy and requires that existing quality of waters be maintained unless degradation is justified based on specific findings. Item 2 of the State Anti-Degradation Policy states:

"Any activity which produces or may produce a waste or increased volume or concentration of waste and which dischargers or proposed to discharge to existing high quality waters will be required to meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to assure that (a) a pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained."

The effluent limitations established in the Order for dichlorobromomethane that have been adjusted for dilution credits provided in Table F-8 were developed based on performance of the Discharger's current wastewater treatment capabilities. Therefore, the Central Valley Water Board determined the effluent limitations required by this Order will result in the Discharger implementing BPTC of the discharge necessary to assure that pollution or nuisance will not occur and the highest water quality consistent with maximum benefit to the people of the State will be maintained. The Central Valley Water Board also determined the Discharger will be in immediate compliance with the effluent limitations,

The Central Valley Water Board also determined establishing effluent limitations for ammonia, copper, and dichlorobromomethane that have been adjusted for dilution credits provided in Table F-8 is consistent with Section 1.4.2.2B of the SIP that requires the Central Valley Water Board to shall deny or significantly limit a mixing zone and dilution credits as necessary to comply with other regulatory requirements.

Therefore, the Central Valley Water Board has determined the effluent limitations established in the Order for ammonia, copper, and dichlorobromomethane that have been adjusted for dilution credits provided in Table F-8 are appropriate and necessary to comply with the Basin Plan, SIP, federal antidegradation regulations, and the State Antidegradation Policy.

- d. **Conversion Factors.** The CTR contains aquatic life criteria for arsenic, cadmium, chromium III, chromium VI, copper, lead, nickel, silver, and zinc which are presented in dissolved concentrations. U.S. EPA recommends conversion factors to translate dissolved concentrations to total concentrations. The default U.S. EPA conversion factors contained in Appendix 3 of the SIP were used to convert the applicable dissolved criteria to total recoverable criteria.

- e. **Hardness-Dependent CTR Metals Criteria.** The CTR and the NTR contain water quality criteria for seven metals that vary as a function of hardness. The lower the hardness the lower the water quality criteria. The metals with hardness-dependent criteria include cadmium, copper, chromium III, lead, nickel, silver, and zinc.

This Order has established the criteria for hardness-dependent metals based on the hardness of the receiving water (actual ambient hardness) as required by the SIP³ and the CTR⁴. The SIP and the CTR require the use of “receiving water” or “actual ambient” hardness, respectively, to determine effluent limitations for these metals. The CTR requires that the hardness values used shall be consistent with the design discharge conditions for design flows and mixing zones⁵. Where design flows for aquatic life criteria include the lowest one-day flow with an average reoccurrence frequency of once in ten years (1Q10) and the lowest average seven consecutive day flow with an average reoccurrence frequency of once in ten years (7Q10).⁶ This section of the CTR also indicates that the design conditions should be established such that the appropriate criteria are not exceeded more than once in a three year period on average.⁷ The CTR requires that when mixing zones are allowed the CTR criteria apply at the edge of the mixing zone, otherwise the criteria apply throughout the water body including at the point of discharge.⁸ The CTR does not define the term “ambient,” as applied in the regulations. Therefore, the Central Valley Water Board has considerable discretion to consider upstream and downstream ambient conditions when establishing the appropriate water quality criteria that fully complies with the CTR and SIP.

i. **Summary Findings**

The ambient hardness for the Feather River is represented by the data in Figure F-1, below, which shows ambient hardness ranging from 30 mg/L to 52 mg/L based on collected ambient data from June 2014 through May 2017. Given the high variability in ambient hardness values, there is no single hardness value that describes the ambient receiving water for all possible scenarios (e.g., minimum, maximum). Because of this variability, staff has determined that based on the ambient hardness concentrations measured in the receiving water, the Central Valley Water Board has discretion to select ambient hardness values within the range of 30 mg/L (minimum) up to 52 mg/L (maximum). Staff recommends that the Board use the ambient hardness values shown in Table F-9 for the following reasons.

- (a) Using the ambient receiving water hardness values shown in Table F-9 will result in criteria and effluent limitations that ensure protection of beneficial uses under all ambient receiving water conditions.
- (b) The Water Code mandates that the Central Valley Water Board establish permit terms that will ensure the reasonable protection of beneficial uses. In this case, using the lowest measured ambient hardness to

³ The SIP does not address how to determine the hardness for application to the equations for the protection of aquatic life when using hardness-dependent metals criteria. It simply states, in Section 1.2, that the criteria shall be properly adjusted for hardness using the hardness of the receiving water.

⁴ The CTR requires that, for waters with a hardness of 400 mg/L (as CaCO₃), or less, the actual ambient hardness of the surface water must be used (40 C.F.R. § 131.38(c)(4)).

⁵ 40 C.F.R. §131.3(c)(4)(ii)

⁶ 40 C.F.R. §131.38(c)(2)(iii) Table 4

⁷ 40 C.F.R. §131.38(c)(2)(iii) Table 4, notes 1 and 2

⁸ 40 C.F.R. §131.38(c)(2)(i)

calculate effluent limitations is not required to protect beneficial uses. Calculating effluent limitations based on the lowest measured ambient hardness is not required by the CTR or SIP, and is not reasonable as it would result in overly conservative limits that will impart substantial costs to the Discharger and ratepayers without providing any additional protection of beneficial uses. In compliance with applicable state and federal regulatory requirements, after considering the entire range of ambient hardness values, Board staff has used the ambient hardness values shown in Table F-9 to calculate the proposed effluent limitations for hardness-dependent metals. The proposed effluent limitations are protective of beneficial uses under all flow conditions.

- (c) Using an ambient hardness that is higher than the minimum of 30 mg/L will result in limits that may allow increased metals to be discharged to the Feather River, but such discharge is allowed under the State Antidegradation Policy (State Water Board Resolution 68-16). The Central Valley Water Board finds that this degradation is consistent with the Antidegradation Policy (see antidegradation findings in Section IV.D.4 of the Fact Sheet). The Antidegradation Policy requires the Discharger to meet waste discharge requirements which will result in BPTC of the discharge necessary to assure that: a) a pollution or nuisance will not occur, and b) the highest water quality consistent with maximum benefit to the people of the State will be maintained.
- (d) Using the ambient hardness values shown in Table F-9 is consistent with the CTR and SIP's requirements for developing metals criteria.

Table F-9. Summary of CTR Criteria for Hardness-dependent Metals

| CTR Metals | Ambient Hardness (mg/L) ^{2,3} | CTR Criteria (µg/L, total recoverable) ¹ | |
|--------------|--|---|---------|
| | | Acute | Chronic |
| Copper | 52 | 7.6 | 5.3 |
| Chromium III | 52 | 1,000 | 120 |
| Cadmium | 52 | 2.2 | 1.5 |
| Lead | 52 | 36 | 1.4 |
| Nickel | 52 | 270 | 30 |
| Silver | 52 | 1.3 | -- |
| Zinc | 52 | 69 | 69 |

- ¹ Metal criteria rounded to two significant figures in accordance with the CTR (40 C.F.R. §131.38(b)(2)).
- ² The ambient hardness values in this table represent actual observed receiving water hardness measurements from the dataset shown in Figure F-1.
- ³ The CTR's hardness dependent metals criteria equations vary differently depending on the metal, which results in differences in the range of ambient hardness values that may be used to develop effluent limitations that are protective of beneficial uses and comply with CTR criteria for all ambient flow conditions.

ii. Background

The State Water Board provided direction regarding the selection of hardness in two precedential water quality orders; WQO 2008-0008 for the City of Davis

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Wastewater Treatment Plant (Davis Order) and WQO 2004-0013 for the Yuba City Wastewater Treatment Plant (Yuba City Order). The State Water Board recognized that the SIP and the CTR do not discuss the manner in which hardness is to be ascertained, thus regional water boards have considerable discretion in determining ambient hardness so long as the selected value is protective of water quality criteria under the given flow conditions. (Davis Order, p.10). The State Water Board explained that it is necessary that, *“The [hardness] value selected should provide protection for all times of discharge under varying hardness conditions.”* (Yuba City Order, p. 8). The Davis Order also provides that, *“Regardless of the hardness used, the resulting limits must always be protective of water quality criteria under all flow conditions.”* (Davis Order, p. 11)

The equation describing the total recoverable regulatory criterion, as established in the CTR, is as follows:

$$\text{CTR Criterion} = \text{WER} \times (e^{m[\ln(H)]+b}) \quad (\text{Equation 1})$$

Where:

H = ambient hardness (as CaCO_3)⁹

WER = water-effect ratio

m, b = metal- and criterion-specific constants

The direction in the CTR regarding hardness selection is that it must be based on ambient hardness and consistent with design discharge conditions for design flows and mixing zones. Consistent with design discharge conditions and design flows means that the selected “design” hardness must result in effluent limitations under design discharge conditions that do not result in more than one exceedance of the applicable criteria in a 3 year period.¹⁰ Where design flows for aquatic life criteria include the lowest one-day flow with an average reoccurrence frequency of once in 10 years (1Q10) and the lowest average 7 consecutive day flow with an average reoccurrence frequency of once in 10 years (7Q10). The 1Q10 and 7Q10 Feather River flows are 1,200 cfs and 1,236 cfs, respectively.

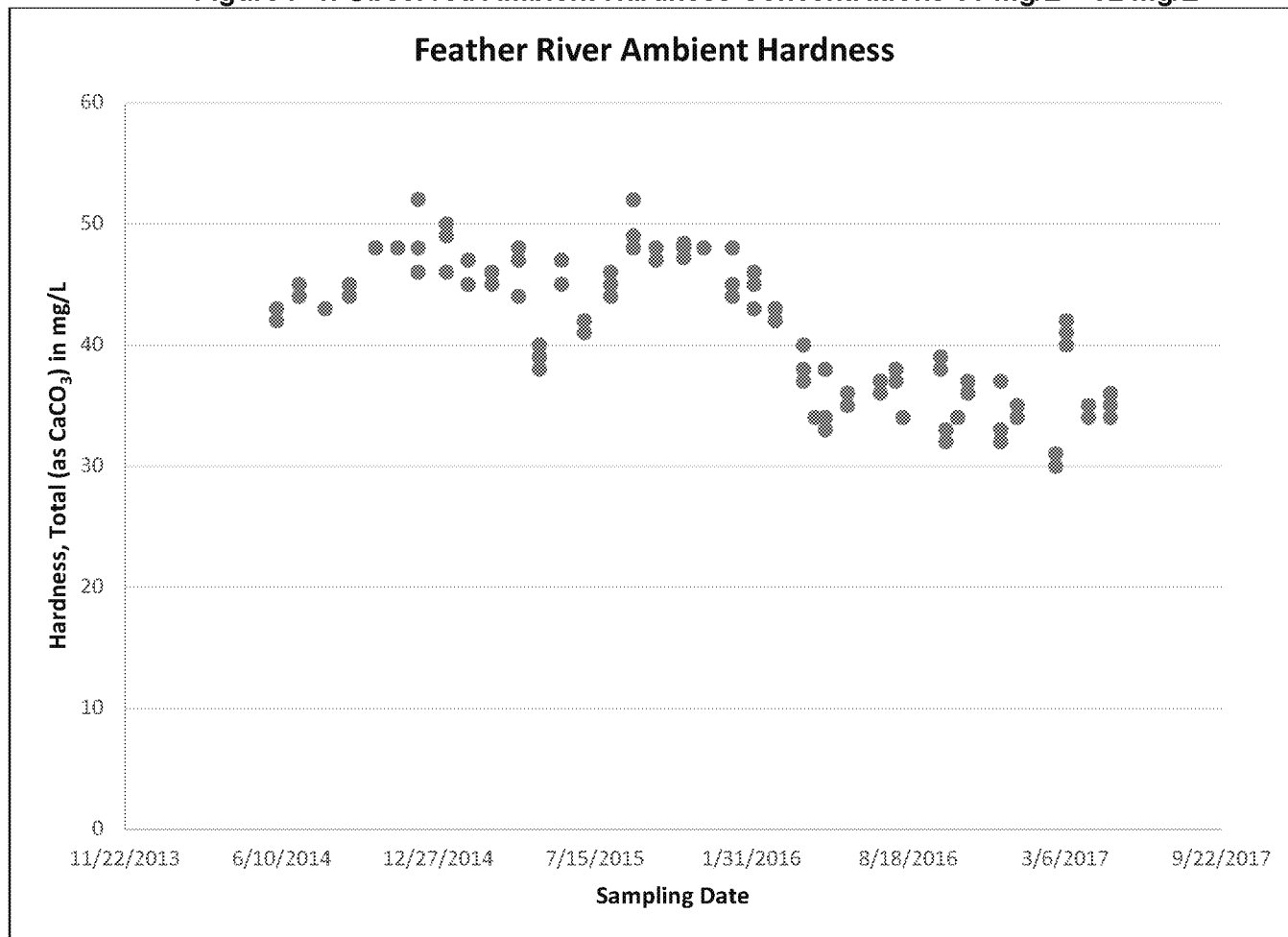
iii. **Ambient Conditions**

The ambient receiving water hardness varied from 30 mg/L to 52 mg/L, based on 111 samples from June 2014 through May 2017 (see Figure F-1).

⁹ For this discussion, all hardness values are expressed in mg/L as CaCO_3 .

¹⁰ 40 C.F.R. §131.38(c)(2)(iii) Table 4, notes 1 and 2

Figure F-1. Observed Ambient Hardness Concentrations 30 mg/L – 52 mg/L



In this analysis, the entire range of ambient hardness concentrations shown in Figure F-1 were considered to determine the appropriate ambient hardness to calculate the CTR criteria and effluent limitations that are protective under all discharge conditions.

iv. Approach to Derivation of Criteria

As shown above, ambient hardness varies substantially. Because of the variation, there is no single hardness value that describes the ambient receiving water for all possible scenarios (e.g., minimum, maximum, mid-point). While the hardness selected must be hardness of the ambient receiving water, selection of an ambient receiving water hardness that is too high would result in effluent limitations that do not protect beneficial uses. Also, the use of minimum ambient hardness would result in criteria that are protective of beneficial uses, but such criteria may not be representative considering the wide range of ambient conditions.

Reasonable worst-case ambient conditions. To determine whether a selected ambient hardness value results in effluent limitations that are fully protective while complying with federal regulations and state policy, staff have conducted an analysis considering varying ambient hardness and flow conditions. To do this, the Central Valley Water Board has ensured that the receiving water

hardness and criteria selected for effluent limitations are protective under “reasonable-worst case ambient conditions.” These conditions represent the receiving water conditions under which derived effluent limitations would ensure protection of beneficial uses under all ambient flow and hardness conditions.

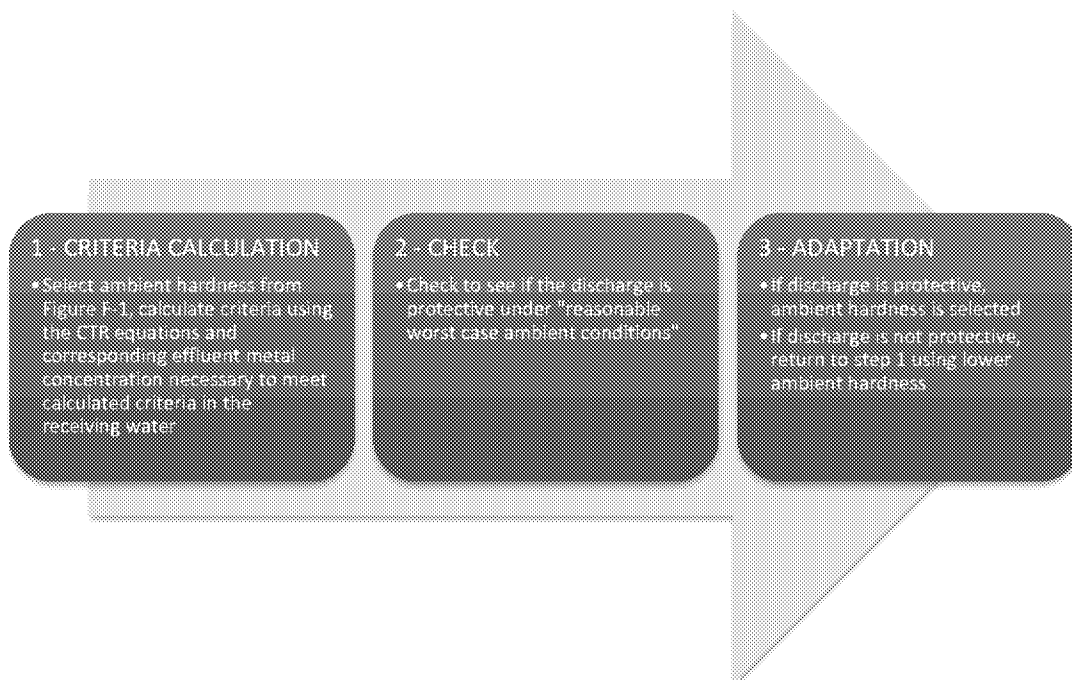
Reasonable worst-case ambient conditions:

- (a) “Low receiving water flow.” CTR design discharge conditions (1Q10 and 7Q10) have been selected to represent reasonable worst case receiving water flow conditions.
- (b) “High receiving water flow (maximum receiving water flow).” This additional flow condition has been selected consistent with the Davis Order, which required that the hardness selected be protective of water quality criteria under all flow conditions.
- (c) “Low receiving water hardness.” The minimum receiving water hardness condition of 30 mg/L was selected to represent the reasonable worst case receiving water hardness.
- (d) “Background ambient metal concentration at criteria.” This condition assumes that the metal concentration in the background receiving water is equal to CTR criteria (upstream of the Facility’s discharge). Based on data in the record, this is a design condition that has not occurred in the receiving water and is used in this analysis to ensure that limits are protective of beneficial uses even in the situation where there is no assimilative capacity.

Iterative approach. An iterative analysis has been used to select the ambient hardness to calculate the criteria that will result in effluent limitations that protect beneficial uses under all flow conditions.

The iterative approach is summarized in the following algorithm and described below in more detail.

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- (a) **CRITERIA CALCULATION.** CTR criteria are calculated using the CTR equations based on actual measured ambient hardness sample results, starting with the maximum observed ambient hardness of 52 mg/L. Effluent metal concentrations necessary to meet the above calculated CTR criteria in the receiving water are calculated in accordance with the SIP.¹¹ This should not be confused with an effluent limit. Rather, it is the Effluent Concentration Allowance (ECA), which is synonymous with the wasteload allocation defined by U.S. EPA as "*a definition of effluent water quality that is necessary to meet the water quality standards in the receiving water.*"¹² If effluent limits are found to be needed, the limits are calculated to enforce the ECA considering effluent variability and the probability basis of the limit.
- (b) **CHECK.** U.S. EPA's simple mass balance equation¹³ is used to evaluate if discharge at the computed ECA is protective. Resultant downstream metal concentrations are compared with downstream calculated CTR criteria under reasonable worst-case ambient conditions.
- (c) **ADAPT.** If step 2 results in:
- (1) Receiving water metal concentration that complies with CTR criteria under reasonable worst-case ambient conditions, then the hardness value is selected.
 - (2) Receiving water metal concentration greater than CTR criteria, then return to bullet 1, selecting a lower ambient hardness value.

¹¹ SIP Section 1.4.B, Step 2, provides direction for calculating the Effluent Concentration Allowance.

¹² U.S. EPA Technical Support Document for Water Quality-based Toxics Control (TSD), pg. 96.

¹³ U.S. EPA NPDES Permit Writers' Handbook (EPA 833-K-10-001 September 2010, pg. 6-24)

The CTR's hardness dependent metals criteria equations contain metal-specific constants, so the criteria vary depending on the metal. Therefore, steps 1 through 3 must be repeated separately for each metal until ambient hardness values are determined that will result in criteria and effluent limitations that comply with the CTR and protect beneficial uses for all metals.

v. **Results of Iterative Analysis**

The above iterative analysis for each CTR hardness-dependent metal results in the selected ambient hardness values shown in Table F-9, above. Using these hardness values to calculate criteria, which are actual sample results collected in the receiving water, will result in effluent limitations that are protective under all ambient flow conditions. Zinc and silver are used as examples below to illustrate the results of the analysis. Tables F-10 and F-11 below summarize the numeric results of the three-step iterative approach for zinc and silver. As shown in the example tables, ambient hardness values of 52 mg/L are used in the CTR equations to derive criteria and effluent limitations. Then under the "check" step, worst-case ambient receiving water conditions are used to test whether discharge results in compliance with CTR criteria and protection of beneficial uses.

The results of the above analysis, summarized in the tables below, show that the ambient hardness values selected using the three-step iterative process results in protective effluent limitations that achieve CTR criteria under all flow conditions. Tables F-10 and F-11 below, summarize the critical flow conditions. However, the analysis evaluated all flow conditions to ensure compliance with the CTR criteria at all times.

Table F-10. Verification of CTR Compliance for Zinc

| Receiving water hardness used to compute effluent limitations | | | | 52 mg/L |
|---|---|---------------------|--|-----------------------------|
| Effluent Concentration Allowance (ECA) for Zinc ² | | | | 69 µg/L |
| | Downstream Ambient Concentrations Under Worst-Case Ambient Receiving Water Conditions | | | Complies with CTR Criteria? |
| | Hardness | CTR Criteria (µg/L) | Ambient Zinc Concentration ¹ (µg/L) | |
| 1Q10 | 31 | 45 | 45 | Yes |
| 7Q10 | 31 | 45 | 45 | Yes |
| Max receiving water flow | 31 | 44 | 44 | Yes |
| ¹ This concentration is derived using worst-case ambient conditions. These conservative assumptions will ensure that the receiving water always complies with CTR criteria. | | | | |
| ² The ECA defines effluent quality necessary to meet the CTR criteria in the receiving water. There are no effluent limitations for zinc as it demonstrates no reasonable potential. | | | | |

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Table F-11. Verification of CTR Compliance for Silver

| Receiving water hardness used to compute effluent limitations | | | | 52 mg/L |
|---|---|---------------------|--|-----------------------------|
| Effluent Concentration Allowance (ECA) for Silver ² | | | | 1.3 µg/L |
| | Downstream Ambient Concentrations Under Worst-Case Ambient Receiving Water Conditions | | | Complies with CTR Criteria? |
| | Hardness | CTR Criteria (µg/L) | Ambient Silver Concentration ¹ (µg/L) | |
| 1Q10 | 31 | 0.55 | 0.55 | Yes |
| 7Q10 | 31 | 0.55 | 0.55 | Yes |
| Max receiving water flow | 31 | 0.54 | 0.54 | Yes |
| ¹ This concentration is derived using worst-case ambient conditions. These conservative assumptions will ensure that the receiving water always complies with CTR criteria. | | | | |
| ² The ECA defines effluent quality necessary to meet the CTR criteria in the receiving water. There are no effluent limitations for silver as it demonstrates no reasonable potential. | | | | |

- f. **Dynamic Modeling Results.** As allowed for under Section 1.4 of the SIP, the Discharger performed dynamic modeling to calculate WQBEL's under Order R5-2007-0134-01 for ammonia and copper. The Discharger used a dynamic modeling approach to directly derive appropriate long-term average wasteload allocations (LTA's) and associated average monthly effluent limitations (AMEL's) and maximum daily effluent limitation (MDEL's) for the discharge to the Feather River, using the approach described in the TSD. Orders R5-2007-0134-01 and R5-2013-0094-01 contained AMEL's and MDEL's for ammonia and copper based on the dynamic model results. The Central Valley Water Board finds that the dynamic model results remain applicable to the discharge. The effluent limitations for copper have been retained in this Order based on the dynamic model results.

For ammonia, a non-priority pollutant that is not subject to the SIP, the MDEL must be replaced with an average weekly effluent limitation (AWEL) in accordance with 40 C.F.R. section 122.45(d), which requires AMEL's and AWEL's for POTW's unless impracticable. The Discharger submitted an 11 September 2017 memorandum *City of Yuba City Dynamic Model Effluent Ammonia Data* (Larry Walker Associates) that proposed an AWEL for ammonia of 51 mg/L based on the 99th percentile of the effluent ammonia data that was utilized in the original model. Therefore, this Order retains the AMEL of 31 mg/L and replaces the MDEL with an AWEL of 51 mg/L.

3. Determining the Need for WQBEL's

Clean Water Act section 301(b)(1)(C) requires effluent limitations necessary to meet water quality standards, and 40 C.F.R. section 122.44(d) requires NPDES permits to include conditions that are necessary to achieve water quality standards established under section 303 of the CWA, including State narrative criteria for water quality. Federal regulations at 40 C.F.R. section 122.44(d)(1)(i) state, "*Limitations must control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level that will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality.*" Additionally, 40 C.F.R. section 122.44(d)(1)(vii) requires effluent limits to be developed consistent with any available wasteload allocations developed and approved for the

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discharge. The process to determine whether a WQBEL is required as described in 40 C.F.R. section 122.44(d)(1)(i) is referred to as a *reasonable potential analysis or RPA*. Central Valley Water Board staff conducted RPA's for nearly 200 constituents, including the 126 U.S. EPA priority toxic pollutants. This section includes details of the RPA's for constituents of concern for the Facility. The entire RPA is included in the administrative record and a summary of the constituents of concern is provided in Attachment G. For priority pollutants, the SIP dictates the procedures for conducting the RPA. For non-priority pollutants the Central Valley Water Board is not restricted to one particular RPA method, therefore, the RPA's have been conducted based on EPA guidance considering multiple lines of evidence and the site-specific conditions of the discharge.

- a. **Constituents with a Total Maximum Daily Load (TMDL).** 40 C.F.R. section 122.44(d)(1)(vii) provides: *"When developing water quality-based effluent limits under [§ 122.44(d)(1)], the permitting authority shall ensure that: (A) The level of water quality to be achieved by limits on point sources established under this paragraph is derived from, and complies with all applicable water quality standards; and (B) Effluent limits developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, are consistent with the assumptions and requirements of any available wasteload allocation for the discharge prepared by the State and approved by EPA pursuant to [Total Maximum Daily Loads regulations]."* U.S. EPA construes 40 C.F.R. section 122.44(d)(1)(vii)(B) to mean that *"when WLAs are available, they must be used to translate water quality standards into NPDES permit limits."* 54 Fed. Reg. 23868, 23879 (2 June 1989).

The Feather River is subject to TMDL's for diazinon and chlorpyrifos and wasteload allocations under those TMDL's are available The Central Valley Water Board developed WQBEL's for these pollutants pursuant to 40 C.F.R. section 122.44(d)(1)(vii), which does not require or contemplate an RPA.

i. **Diazinon and Chlorpyrifos**

- (a) **WQO.** The Central Valley Water Board completed a TMDL for diazinon and chlorpyrifos in the Sacramento and Feather Rivers and amended the Basin Plan to include diazinon and chlorpyrifos WLA's and water quality objectives. The Basin Plan Amendment for the Control of Diazinon and Chlorpyrifos Runoff into the Sacramento and Feather Rivers was adopted by the Central Valley Water Board on 3 May 2007 and became effective on 11 August 2008.

The amendment modified Basin Plan Chapter III (Water Quality Objectives) to establish site-specific numeric objectives for diazinon and chlorpyrifos in the Sacramento and Feather Rivers and identified the requirements to meet the additive formula already in Basin Plan Chapter IV (Implementation) for the additive toxicity of diazinon and chlorpyrifos.

The Basin Plan states at section 4.5.5.1(6) that *"The Waste Load Allocations (WLA) for all NPDES-permitted dischargers...shall not exceed the sum (S) of one (1) as defined below.*

$$S = \frac{C_d}{WQO_d} + \frac{C_c}{WQO_c} \leq 1.0$$

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Where:

C_D = diazinon concentration in $\mu\text{g/L}$ of point source discharge for WLA...

C_C = chlorpyrifos concentration in $\mu\text{g/L}$ of point source discharge for the WLA...

WQO_d = acute or chronic diazinon water quality objective in $\mu\text{g/L}$.

WQO_c = acute or chronic chlorpyrifos water quality objective in $\mu\text{g/L}$.

Available samples collected within the applicable averaging period for the water quality objective will be used to determine compliance with the allocations and loading capacity. Prior to performing any averaging calculations, only chlorpyrifos and diazinon results from the same sample will be used in calculating the sum (S). For purposes of calculating the sum (S) above, analytical results that are reported as 'nondetectable' concentrations are considered to be zero."

The Discharger is an NPDES-permitted discharger to the Feather River subject to the WLA's in the TMDL.

- (b) **RPA Results.** Diazinon was not detected in the effluent based on 17 samples collected between June 2014 and May 2017. Diazinon was not detected in the upstream receiving water based on four samples collected between June 2014 and May 2017.

Chlorpyrifos was not detected in the effluent based on 17 samples collected between June 2014 and May 2017. Chlorpyrifos was not detected in the upstream receiving water based on four samples collected between June 2014 and May 2017.

Although diazinon and chlorpyrifos were not detected in the effluent or receiving water, because WLA's in the TMDL for diazinon and chlorpyrifos in the Sacramento and Feather Rivers are applicable, WQBEL's for these constituents are required. The TMDL WLA's apply to all NPDES dischargers to the Sacramento and Feather Rivers and serves as the basis for WQBEL's for this Facility.

- (c) **WQBEL's.** WQBEL's for diazinon and chlorpyrifos are required based on the TMDL for diazinon and chlorpyrifos for the Sacramento and Feather Rivers. Therefore, this Order includes effluent limits applicable at Discharge Points 001 and 002 calculated based on the WLA's contained in the TMDL, as follows:

- (1) Average Monthly Effluent Limitation (AMEL)

$$S_{AMEL} = \frac{C_{D\ M-avg}}{0.079} + \frac{C_{C\ M-avg}}{0.012} \leq 1.0$$

$C_{D\ M-avg}$ = average monthly diazinon effluent concentration in $\mu\text{g/L}$

$C_{C\ M-avg}$ = average monthly chlorpyrifos effluent concentration in $\mu\text{g/L}$

- (2) Average Weekly Effluent Limitation (AWEL)

$$S_{AWEL} = \frac{C_{D\ W-avg}}{0.14} + \frac{C_{C\ W-avg}}{0.021} \leq 1.0$$

$C_{D\ W-avg}$ = average weekly diazinon effluent concentration in $\mu\text{g/L}$

$C_{C\ W-avg}$ = average weekly chlorpyrifos effluent concentration in $\mu\text{g/L}$

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- (d) **Plant Performance and Attainability.** Diazinon and chlorpyrifos were not detected in the effluent. The Central Valley Water Board concludes, therefore, that immediate compliance with these effluent limitations is feasible.

- b. **Constituents with No Reasonable Potential.** Central Valley Water Board staff conducted RPA's for nearly 200 constituents, including the 126 U.S. EPA priority toxic pollutants. All RPA's are included in the administrative record and a summary of the constituents of concern is provided in Attachment G. WQBEL's are not included in this Order for constituents that do not demonstrate reasonable potential to cause or contribute to an instream excursion of an applicable water quality objective; however, monitoring for those pollutants is established in this Order as required by the SIP. If the results of effluent monitoring demonstrate reasonable potential, this Order may be reopened and modified by adding an appropriate effluent limitation.

Most constituents with no reasonable potential are not discussed in this Order. This section only provides the rationale for the RPA's for the following constituents of concern that were found to have no reasonable potential after assessment of the data:

i. **Bis (2-ethylhexyl) Phthalate**

- (a) **WQO.** The CTR includes a criterion of 1.8 µg/L for bis (2-ethylhexyl) phthalate for the protection of human health for waters from which both water and organisms are consumed. Order R5-2013-0094-01 included effluent limitations for bis (2-ethylhexyl) phthalate based on the CTR human health criterion.
- (b) **RPA Results.** Bis (2-ethylhexyl) phthalate was detected but not quantified in the effluent at estimated concentrations ranging from 0.9 µg/L to 1.9 µg/L in four of 40 samples collected between June 2014 and May 2017. Bis (2-ethylhexyl) phthalate was not detected in the effluent in the remaining 36 samples. Bis (2-ethylhexyl) phthalate was not detected in the upstream receiving water based on four samples collected between June 2014 and May 2017.

As shown in the table below, the MEC for bis (2-ethylhexyl) phthalate exceeds the applicable CTR criterion.

Table F-12. Summary of Effluent Data for Bis (2-Ethylhexyl) Phthalate

| Effluent | | | | Background (µg/L) | Lowest MDL (µg/L) | Lowest RL (µg/L) | SIP ML (µg/L) |
|---------------|-------------------|--------------|---------------|----------------------|-------------------------|------------------------|---------------------|
| MEC (µg/L) | No. of Samples | No. of ND | No. of DNQ | | | | |
| 1.9 (DNQ) | 40 | 36 | 4 | <0.5 | 0.50 | 3 | 5 |

SIP Section 2.4.2 states that the Minimum Level (ML) is the lowest quantifiable concentration in a sample based on the proper application of all method-based analytical procedures and the absence of any matrix interferences.

- (1) Required ML's are listed in Appendix 4 of the SIP. Where more than one ML is listed in Appendix 4, the Discharger may select any one of the cited analytical methods for compliance determination. The

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selected ML used for compliance determination is referred to as the Reporting Level (RL).

- (2) An RL can be lower than the ML in Appendix 4 only when the Discharger agrees to use a RL that is lower than the ML listed in Appendix 4. The Central Valley Water Board and the Discharger have no agreement to use a RL lower than the listed ML.
- (3) SIP Section 1.2 requires that the Regional Board use all available, valid, relevant, representative data and information, as determined by the Regional Board, to implement the SIP. SIP Section 1.2 further states that the Regional Board has the discretion to consider if any data are inappropriate or insufficient for use in implementing the SIP.
- (4) Data reported below the ML indicates the data may not be valid due to possible matrix interferences during the analytical procedure.
- (5) Further, SIP Section 2.4.5 (Compliance Determination) supports the insufficiency of data reported below the ML or RL. In part it states, *“Dischargers shall be deemed out of compliance with an effluent limitation, for reporting and administrative enforcement purposes, if the concentration of the priority pollutant in the monitoring sample is greater than the effluent limitation and greater than or equal to the RL.”* Thus, if submitted data is below the RL, that data cannot be used to determine compliance with effluent limitations.
- (6) Data reported below the ML is not considered valid data for use in determining reasonable potential. Therefore, in accordance with Section 1.2 of the SIP, the Central Valley Water Board has determined that data reported below the ML is inappropriate and insufficient to be used to determine reasonable potential.

SIP Appendix 4 cites two ML's for bis (2-ethylhexyl) phthalate. The lowest applicable ML cited for bis (2-ethylhexyl) phthalate is 5 µg/L. The Discharger used an analytical method that was more sensitive than the ML required by the SIP. The maximum effluent result was an estimated value (i.e., DNQ). Therefore, the submitted effluent bis (2-ethylhexyl) phthalate estimated data is inappropriate and insufficient to determine reasonable potential under the SIP.

Because bis (2-ethylhexyl) phthalate was not detected above the criterion in the remaining effluent samples, the Central Valley Water Board concludes that bis (2-ethylhexyl) phthalate in the discharge does not demonstrate reasonable potential to cause or contribute to an in-stream excursion above the CTR human health criterion of 1.8 µg/L, and the effluent limitations for bis (2-ethylhexyl) phthalate have not been retained in this Order. Removal of these effluent limitations is in accordance with federal anti-backsliding regulations (see section IV.D.3 of the Fact Sheet).

ii. **Lead**

- (a) **WQO.** The CTR includes hardness-dependent criteria for the protection of freshwater aquatic life for lead. These criteria for lead are presented in dissolved concentrations, as 1-hour acute criteria and 4-day chronic criteria. U.S. EPA recommends conversion factors to translate dissolved concentrations to total concentrations. Default U.S. EPA translators were

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used for the effluent and receiving water. As described in section IV.C.2.e of this Fact Sheet, the applicable acute and chronic criteria for lead are 33 µg/L and 1.3 µg/L, respectively, as total recoverable. Order R5-2013-0094-01 included effluent limitations for lead based on the CTR aquatic life criteria.

- (b) **RPA Results.** The MEC for lead in the effluent was 0.52 µg/L based on 40 samples collected between June 2014 and May 2017. The maximum observed upstream receiving water lead concentration was 0.71 µg/L based on four samples collected between June 2014 and May 2017. Therefore, lead in the discharge does not demonstrate reasonable potential to cause or contribute to an in-stream excursion above the CTR chronic aquatic life criterion of 1.3 µg/L, and the effluent limitations for lead have not been retained in this Order. Removal of these effluent limitations is in accordance with federal anti-backsliding regulations (see section IV.D.3 of the Fact Sheet).

iii. **Manganese**

- (a) **WQO.** The Secondary MCL – Consumer Acceptance Limit for manganese is 50 µg/L. The State Water Board Division of Drinking Water (DDW) has established Secondary Maximum Contaminant Levels (MCL's) to assist public drinking water systems in managing their drinking water for public welfare considerations, such as taste, color, and odor. The Secondary MCL is used to implement the Basin Plan's chemical constituent objective for the protection of municipal and domestic supply. Order R5-2013-0094-01 included an effluent limitation for manganese based on the Secondary MCL.
- (b) **RPA Results.** For priority pollutants, the SIP dictates the procedures for conducting the RPA. Manganese is not a priority pollutant. Therefore, the Central Valley Water Board is not restricted to one particular RPA method. Due to the site-specific conditions of the discharge, the Central Valley Water Board has used its judgment in determining the appropriate method for conducting the RPA for this non-priority pollutant constituent. The most stringent objective is the Secondary MCL, which is derived from human welfare considerations (e.g., taste, odor, laundry staining), not for toxicity. Secondary MCL's are drinking water standards contained in Title 22 of the California Code of Regulations. Title 22 requires compliance with these standards on an annual average basis, when sampling at least quarterly. To be consistent with how compliance with the standards is determined, the Central Valley Water Board conducts the RPA for manganese based on the calendar year annual average effluent manganese concentrations.

The maximum calendar annual average concentration for manganese in the effluent was 29 µg/L (in calendar year 2014). Therefore, manganese in the discharge does not demonstrate reasonable potential to cause or contribute to an in-stream excursion above the Secondary MCL of 50 µg/L, and the effluent limitation for manganese has not been retained in this Order. Removal of this effluent limitation is in accordance with federal anti-backsliding regulations (see section IV.D.3 of the Fact Sheet).

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